Remarks

Applicants believe that this amendment places the subject application in better condition for allowance and in so doing introduces no new issues. Therefore, entry of this Amendment, reconsideration of the application, and allowance of all claims pending herein is respectfully requested.

Claims 1-15 were originally presented in the subject application. Claims 1, 3, 4, 6, 7, and 11-14 have been amended in the above amendment. Claims 16-18 are new. Claims 1-18 are pending.

The Examiner's concerns are addressed separately below in the order raised in the outstanding Office Action. No new matter has been added.

Rejections under 35 U.S.C. §102

Claims 1-8 and 10-14 stand rejected under 35 U.S.C. § 102 as anticipated by Mikio, JP 2000-020501. To the extent deemed pertinent in light of the amended claims, Applicant respectfully traverses this rejection for the reasons set forth below.

1. Mikio does not disclose efficient use of all computers during data exchange

As recited in claim 6, no computers are left idle during partner exchange if there is an even number of computers, and only one is left idle if the total number of computers is odd. Amended claim 6 recites:

> wherein each computer PCi of said plurality n is configured ~~to~~ for partner exchange of n-1 partial data units with a partner computer, so that no computer is left idle, when n is an even number; ~~, and~~
>
> wherein each computer PCi of said plurality n is configured for partner exchange of n partial data units with a partner computer, so that no more than one computer is left idle, when n is an odd number.

In contrast, Mikio does not disclose a method with a partner exchange in which no computers are left idle, or only one is left idle. Mikio leaves more than one processing unit idle during the data exchange steps. In Mikio Fig. 5, PE-6 and PE-7 are idle for the first step, and in Fig. 7, PE-8 and PE-9 are idle for two steps. In some instances, many of the Mikio processor

units are dummy units without data, which remain idle during the data exchange steps. As discussed in a previous response, in some instances, nearly half of the processors are dummy units which do not exchange data.

2. *Mikio does not disclose leaving no more than one computer idle during data exchange*

According to the Office Action, "the computer repeats steps that computers transmit their allocated partial data to the partner computer which is connected to said computer between each other ([0059]." (Office Action p.3). However, the independent claims have been amended to clarify that no more than one computer is left idle during the partner exchange.

Amended claim 1 recites:

> wherein each computer PCi of said plurality n is configured ~~to~~ for a first exchange of a partial data- unit with a partner computer chosen from said plurality n of computers, so that no more than one computer PCi is idle during said first exchange; and
>
> wherein each computer PCi of said plurality n is configured ~~to~~ for an additional exchange of additional partial data units with a partner computer chosen from said plurality n of computers, so that no more than one computer PCi is idle during said additional exchange.

Amended claim 3 recites:

> wherein each computer PCi of said plurality n is configured ~~to~~ for partner exchange of n-1 partial data units with a partner computer, so that no more than one computer is left idle during the partner exchange.

Amended claims 4, 7 and 11-14 similarly recite:

> wherein each computer PCi of said plurality n is configured ~~to~~ for partner exchange of a partial data- unit with a partner computer chosen from said plurality n of computers, so that no more than one computer PCi is left idle during the partner exchange.

As discussed above, Mikio leaves more than one processing unit idle during the data exchange steps. (Mikio Fig. 5,7). Since Mikio does not anticipate the claimed data exchange embodiments, in which no more than one computer is left idle, Mikio does not anticipate the claimed invention.

3. Mikio does not disclose the claimed approach to data division and data exchange

The Examiner notes that "Mikio teaches a system wherein nodes of a parallel system exchange data for processing." Mikio does not anticipate the claim unless it discloses "not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim," the standard for anticipation set out in the recent case of *Net Moneyin, Inc., v. Verisign, Inc.*, Slip.op.2007-1565, 17-18 (Fed.Cir. 2008) (copy submitted with response).

Mikio does not disclose the claimed approach of dividing the original data units into two sets of partial data units. Claims 1, 3, 11, 13, and 14 recite both "data Xi being divisible into n partial data units Xi(j), j being an integer from 0 to n-1;" and "data Xi being divisible into n partial data units Xi(k), k being an integer from 0 to n-1." Similarly, claims 4, 7, and 12 recite both "data Xi being divisible into n partial data units Xi(m), m being an integer from 0 to n-1;" and "data Xi being divisible into n partial data units Xi(k), k being an integer from 0 to n-1," n being the number of computers.

In contrast, Mikio appears to disclose only one division of data. One example of a starting configuration for Mikio may be represented by the following.

Mikio:

**********START**********

PE0={a(0), 0, 0, 0, 0, 0, 0, 0}

PE1={ 0,a(1), 0, 0, 0, 0, 0, 0}

PE2={ 0, 0,a(2), 0, 0, 0, 0, 0}

PE3={ 0, 0, 0,a(3), 0, 0, 0, 0}

PE4={ 0, 0, 0, 0,a(4), 0, 0, 0}

PE5={ 0, 0, 0, 0, 0,a(5), 0, 0}

PE6={ 0, 0, 0, 0, 0, 0,a(6), 0}

PE7={ 0, 0, 0, 0, 0, 0, 0,a(7)}

****

Mikio calls for only one division of each data unit, and distributing each original data unit among the computers, resulting in the following.

**********END**********

PE0={a(0),a(1),a(2),a(3),a(4),a(5),a(6),a(7)}

PE1={a(0),a(1),a(2),a(3),a(4),a(5),a(6),a(7)}

PE2={a(0),a(1),a(2),a(3),a(4),a(5),a(6),a(7)}

PE3={a(0),a(1),a(2),a(3),a(4),a(5),a(6),a(7)}

PE4={a(0),a(1),a(2),a(3),a(4),a(5),a(6),a(7)}

PE5={a(0),a(1),a(2),a(3),a(4),a(5),a(6),a(7)}

PE6={a(0),a(1),a(2),a(3),a(4),a(5),a(6),a(7)}

PE7={a(0),a(1),a(2),a(3),a(4),a(5),a(6),a(7)}

****

Since Mikio does not disclose the extra division of data, thereby disclosing a different approach to dividing and exchanging data among computers, it does not teach the claimed elements as arranged in the claim, as required by the above-referenced *Net Moneyin, Inc., v. Verisign, Inc.* case. Therefore, Mikio does not anticipate the claims.

4. Mikio does not disclose a system which works with other than 2^x computers.

The claimed invention works with any number of computers (n) greater than two. New claim 16 recites "wherein n is an odd number." New claim 17 recites that "$n = 2^K + 1$, wherein k is an integer greater than 0," and new claim 18 recites "$n = 2^K - 1$, wherein k is an integer greater than 0." As used by Applicants, n refers to the number of computers.

Mikio could not disclose this, because the Mikio approach only works with 2^x computers, wherein x is an integer greater than zero. If the starting number of computers is other than 2^x, then Mikio discloses either dividing the computers into groups of 2^x, or adding dummy units, which remain idle during the data exchange, until the total number of units is 2^x. (Mikio ¶¶ 0046-49, 0051, 0053, 0055, 0058, 0062). The value of 2^x, wherein x is an integer, cannot be odd. Therefore, Mikio does not anticipate claim 6, which recites an odd number of computers. Mikio also does not anticipate claims 17 and 18, each of which explicitly recites a number of computers which is not 2^x.

Rejections under 35 U.S.C. §103:

Claims 9 and 15 stand rejected under § 103 as unpatentable over Mikio, JP 2000-020501 in view of Official Notice. To the extent deemed pertinent in light of the amended claims, this rejection is respectfully traversed.

The Office Action states the following.

> For claim 9, Mikio fails to explicitly disclose that the network medium allows for full duplex communications. However, Examiner takes Official Notice that full duplex network communication among computing entities was commonplace well prior to the time of the claimed invention and, as such, was an obvious feature for the parallel computing system disclosed in Mikio.
>
> It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Mikio to incorporate full duplex communication, because this modification would allow the computing entities of Mikio to simultaneously transmit and receive information across a network. As such, this modification allows for increased network throughput and efficiency.

(Office Action p.10).

A modification or combination of references is not obvious unless there is an "apparent reason" to modify or combine the references. *In re Whalen*, Appeal No. 2007-4423 (BPAI 2008) (copy submitted with this response). The *Whalen* Board court stated that "[t]he *KSR* Court noted that obviousness cannot be proven merely by showing that the elements of a claimed device were known in the prior art; it must be shown that those of ordinary skill in the art would have had some 'apparent reason to combine the known elements in the fashion claimed.'" *In re Whalen*, Appeal 2007-4423 for Application 10/281,142, p. 16 (BPAI 2008) (quoting *KSR Int.'l Co. v. Teleflex, Inc.*, 127 S.Ct. 1727, 1741 (2007)).

There would be no apparent reason to add full duplex communications to the Mikio approach. Installing duplex communications lines on the Mikio system would likely be more expensive than using one-way lines. Using duplex lines would also be an inefficient use of resources, since Mikio does not operate on a principle of simultaneous sending and receipt of data. For the Mikio system, it appears that simultaneous sending and receipt of data would result in an error, and duplex lines would only enable this erroneous exchange.

Also, "[i]f the proposed modification or combination of the prior art would change the

principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." MPEP § 2143.01(VI). Modifying the Mikio disclosure to include duplex lines, and therefore the simultaneous sending and receipt of data, would change Mikio's principle of operation, from one-way transmission to two-way transmission.

Therefore, the invention is not obvious in light of Mikio and Official Notice.

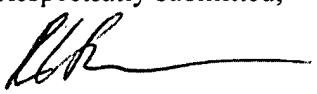
CONCLUSION

For at least any one of the foregoing alternate reasons, Applicants submit that the dependent claims are allowable for the same reasons as the independent claims from which they directly or ultimately depend, as well as for their additional limitations. Applicants therefore further submit that all of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot.

This application is now believed to be in condition for allowance, and such action at an early date is respectfully requested. However, if any matters remain unresolved, the Examiner is encouraged to contact the undersigned by telephone.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 50-0734** referencing Docket No. 1215.004. However, the Assistant Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,



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